

Mass-Optimized UltraFlex Solar Array with Integrated IMM Cell Flexible Blanket, Phase I

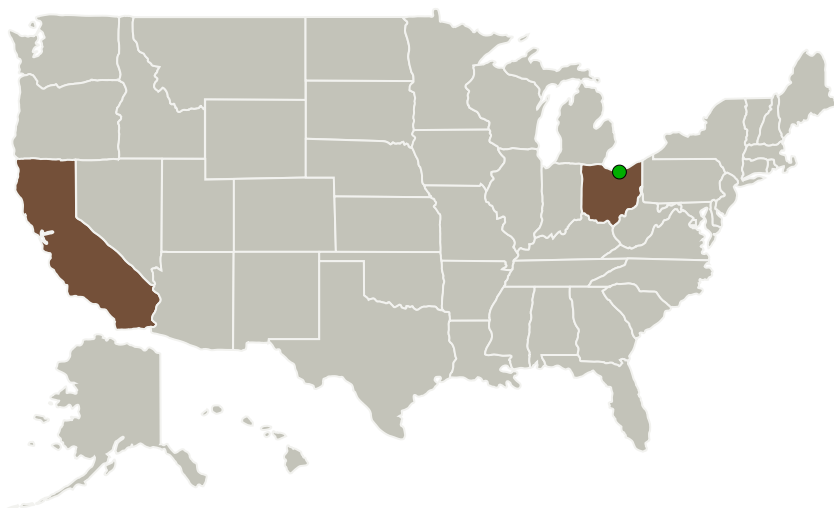
Completed Technology Project (2010 - 2010)



Project Introduction

Deployable Space Systems (DSS), in partnership with ATK Space and EMCORE, will focus the proposed SBIR program on the optimization and design development of the most promising advanced space photovoltaic subsystem now available: EMCORE's ultra-thin 33% BOL-efficient Inverted Metamorphic Multijunction (IMM) solar cell that is interconnected and integrated onto an advanced flexible blanket; specifically for implementation on the lightest solar array structural system currently in use, ATK's UltraFlex. The proposed innovative and synergistic solutions will produce a near-term, low-risk solar array system that provides breakthrough performance in terms of highest specific power (>500 W/kg BOL), light weight, scalability to large (>15 kW) wing sizes, high deployed stiffness, high deployed strength, compact stowage volume (>50 kW/m³ BOL), high voltage operation capability, reliability, affordability, and rapid commercial readiness. The proposed effort will focus on increasing the design fidelity (TRL) of promising IMM-integrated onto UltraFlex blanket solutions configured to meet key high-voltage SEP / deep space science mission requirements. The development of feasible ultra-lightweight integrated IMM PV UltraFlex solar array technology will enable future missions, including near-to-medium term NASA Discovery and New Frontiers-class interplanetary, planetary orbital, comet rendezvous and Solar Electric Propulsion (SEP) science missions as well as future Orion/CEV Lunar sortie missions.

Primary U.S. Work Locations and Key Partners



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| Organizations Performing Work | Role | Type | Location |
|------------------------------------|-------------------------|-------------|--------------------|
| Deployable Space Systems, Inc(DSS) | Lead Organization | Industry | Goleta, California |
| ● Glenn Research Center(GRC) | Supporting Organization | NASA Center | Cleveland, Ohio |

| Primary U.S. Work Locations | |
|-----------------------------|------|
| California | Ohio |

Project Transitions

January 2010: Project Start

July 2010: Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/140579>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Deployable Space Systems, Inc (DSS)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

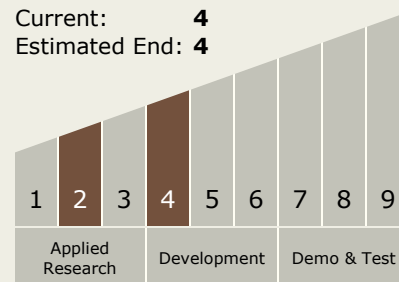
Brian R Spence

Technology Maturity (TRL)

Start: 2

Current: 4

Estimated End: 4



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Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
 - └ TX03.1 Power Generation and Energy Conversion
 - └ TX03.1.1 Photovoltaic

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System